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A Vitalist Stopover on the Way to a New Materialism

This essay is part of a larger study of materiality in politics, in which I experiment with narrating events (a power blackout, a crisis of obesity) in a way that presents non-human materialities (electricity, fats) as themselves bona fide agents rather than as instrumentalities, techniques of power, recalcitrant objects, or social constructs. What would happen to our thinking about politics if we took more seriously the idea that technological and natural materialities were themselves actors alongside and within us—were vitalities, trajectories, and powers irreducible to the meanings, intentions, or symbolic values humans invest in them? I'm in search of a materialism in which matter is an active principle and, though it inhabits us and our inventions, also acts as an outside or alien power. This new, "vital materialism" would run parallel to a historical materialism focused more exclusively upon economic structures of human power.

Of course, such a "thing-power" materialism would not be radically new, but part ad hoc invention and part a gathering of elements from preexisting traditions—from historical lines of thought in which materiality is figured not as inert or even passively resistant but as active and energetic, albeit not purposive in any strong sense. According to that tradition—which includes for me Epicurus, Lucretius, Hobbes, Spinoza, La Mettrie, Diderot,

the Marx of his dissertation on Democritus, the aleatory materialism of Althusser, Deleuze, and others — the distinctions between life and matter, organic and inorganic, human and nonhuman, man and god, are not necessarily the most important ones to honor.

In addition to these materialisms, I find a rich source of ideas about materiality in the tradition of **vitalism**. Especially those early twentieth-century strands called “critical” or “modern” vitalism.² These vitalists, who distinguished themselves from the “naive vitalism” of soul by means of their close engagement with experimental science, fought doggedly against one *kind* of materialism — the kind for which materiality is mechanical in operation and thus in principle always calculable to humans. Because the critical vitalists and I share a common foe in mechanistic or deterministic materialism, I devote this essay to one of them: Hans Driesch (1867–1941).

Driesch’s Gifford lectures in 1907–8 at the University of Aberdeen on “The Science and Philosophy of the Organism,” along with the work of his contemporary Henri Bergson, played a significant part in the popular enthusiasm for vitalism in America in the years before the First World War.³ Central to this vitalism was the idea that “life” was irreducible to “matter,” that there existed a life-principle that animates matter, exists only when in a relationship with matter, but is not itself of a material nature.⁴ “The concept of *nature* must be enlarged,” writes Driesch, so that it “consists of one completely spatial and one only partly spatial portion.”⁵ The “vital principle” resides in the latter and provides the impetus for morphological changes in the embryo. But the scope of critical vitalism was not restricted to biology, for the same vital principle was also thought to be responsible for the progressive development of personality and history: insofar as seeds, embryos, personalities, and cultures were all *organic* wholes, there was an isomorphism between physical, psychological, and civilizational orders.

There was some disagreement among vitalists about just how to depict the vital force: Bergson’s *élan vital*, for example, competed with Driesch’s entelechy. But on the question of “matter,” the vitalists were in agreement with each other, as well as with their “materialist” opponents: matter was unfree, mechanistic, and deterministic (though “dynamic” in the sense of capable of undergoing regular changes of state). Whereas the vitalists lifted instances of “life” outside of the reach of this mechanical world, the

materialists insisted that every entity or force, however complex, organic, or subtle, was (ultimately or in principle) explicable in mechanical or, as they called it, “physico-chemical” terms.

While Driesch does not go as far as I do toward a materialist ontology, he does insist that the “vital principle” has absolutely no existence independent of “physico-chemical” matter. He makes the relationship between matter and life as close as it possibly can be while still retaining the distinction. I am thus intrigued by Driesch because he pushes the life-matter binary to the limit, even though, at the very last minute, he draws back from taking the plunge into a materiality that is *itself* vibrant or active. It is instructive to see why he draws back: it is for the sake of freedom conceived as a persistent capacity of the natural world to surprise — to produce events not fully determined by their antecedents. This picture of an aleatory world is one that my “vital materialism” too affirms.

Driesch identified a not-wholly calculable, not-quite-material impetus as responsible for organic becoming. Perhaps one of the reasons he, like Bergson, enjoyed popularity in America was because he was received as a defender of freedom, of a certain open-endedness to life, in the face of a modern science whose pragmatic successes were threatening to confirm definitively the picture of the universe as a godless machine. Driesch, a German embryologist, was also one of the first non-Jews to be stripped of his professorship by the Nazis because he objected to their use of his vitalism to justify German conquest of “less vital” peoples. I shall take up the question of the relationship of vitalism to political violence at the end of the essay, where I contrast Driesch’s vitalism with that of American evangelical advocates of the “culture of life,” a latter-day vitalism conjoined to a doctrine of preemptive war.

But first, I turn to Driesch’s entelechy, to his notion of vital force: a life-principle that activated the dull stuff of matter. The haunting association of matter with passivity, which Driesch almost but not quite overcame, is my target. It must go if we are to become more adept at discerning and contending productively with the force of things, with the positive vitality possessed by nonhuman entities and forces.

Entelechy

Driesch was a Kantian, at least at first. Kant, in the *Critique of Judgment*, had repeatedly insisted upon the figure of passive matter: matter "as such" can have no "spontaneity."⁶ "We cannot even think of living matter as possible. (The concept of it involves a contradiction, since the essential character of matter is lifelessness, *inertia*)."⁷ We must not "endow matter, as mere matter, with a property ([namely, the property of life, as] hylozoism [does]) that conflicts with its nature."⁸ Driesch affirms Kant's image of matter to the extent that Driesch affirms the need for a nonmaterial supplement to direct, organize, and animate matter. Driesch also echoes Kant's claim that the vital principle would never become fully transparent to us and could be known only as an invisible presence that performs the tasks that are in fact performed within the organism but which no mechanical matter could ever possibly perform by itself. Entelechy is born in the negative spaces of the machine model of nature, in the "gaps" in the "chain of strictly physico-chemical or mechanical events."⁹

Driesch's case for entelechy proceeds thus, first, by way of transcendental arguments: "x *must* be operative, given the indisputable reality of y." To show how the vital principle cannot be "physico-chemical" in nature, for example, he starts from the observation that, in morphogenesis (the process by which a fertilized egg becomes an adult organism), "manifoldness in space is produced where no manifoldness was." Though on first glance it might seem that this manifoldness in space emerged directly from the spatially uniform, undifferentiated egg, theoretical reason reveals this to be impossible: a *spatial* manifold cannot have a *spatial* unity as its source. Thus, it must be that *some other kind* of "manifold" is present "previous to morphogenesis." Lacking an "extensive character," this prior manifold, the basis of the organism's later differentiation, *must* be an "intensive manifoldness,"¹⁰ that is, "an agent acting manifoldly without being in itself manifold in space" (vol. 2, 250). "That is to say, [it is] . . . composite, though not in space" (vol. 2, 316). We have, then, a first definition of *entelechy*: it is the *intensive* manifoldness out of which emerges the extensive manifoldness of the mature organism.

Driesch's negative and indirect case for vitalism proceeds, second, by way of his positive and direct interventions and observations in the laboratory. Indeed, what had initially provoked Driesch to posit the "autonomy

of life" was not theoretical reason but experiments on cell-division in the sea urchin. Calculated intrusion into the mechanism of sea urchins paradoxically uncovered the fact that life was inexplicable if conceived exclusively as a mechanism. But the fact that Driesch insists upon the inadequacy of mechanical explanation does not mean that his entelechy is a "psychic" factor: "It is important to grasp the *provisional negativeness* of entelechy, because it will save us from a mistake . . . of regarding the vitalistic agent as something 'psychical.' . . . But the contrary of *mechanical* is merely *non-mechanical*, and not 'psychical'" (vol. 2, 115).¹¹ For Driesch the critical vitalist, the vital principle must be conceived as *neither* mechanical body nor ethereal soul.

The goal of Driesch's laboratory work and the reason for his strict adherence to the protocols of empirical science was not simply to gain a more subtle understanding of the dynamic chemical and physical properties of the organism but also to better discern what *animated* the machine: "Why then occurs all that folding, and bending . . . , and all the other processes we have described? There must be something that *drives them out*, so to say."¹² Driesch names that something, that animating impetus inside the embryo, entelechy. Neither a substance nor an energy (though active only in relation to those phenomena), entelechy is "the non-mechanical agent responsible for the phenomena of life."¹³ Driesch borrows his term of art *entelechy* from Aristotle, retaining its sense of a self-moving and self-altering power but rejecting its peculiarly Aristotelian teleology.¹⁴

In addition to animating matter, entelechy is also what "arranges" or composes artistically the bodies of organisms. In order to see how entelechy performs this, its "forming" task, *nonmechanically*, we need to take a closer look at morphogenesis, the mode of becoming Driesch says is unique to organisms. Morphogenesis refers both to the process by which a blastocyst moves from a less to a more differentiated form (ontogenesis) and to the process by which a mature organism re-forms itself in response to damage or disease (restitution).¹⁵ While inorganic matter is capable of *change*, only life can *morph*: a crystal formation can diminish or increase in mass, but it cannot become qualitatively more complex and it cannot restore itself by replacing or repairing parts such that the "same" whole endures. "The organism is different . . . from all combinations of crystals, such as those called dendrites . . . which consists of a typical arrangement of identical units. . . . For this reason, dendrites . . . must be called aggre-

gates; but the organism is not an aggregate" (vol. 1, 25). The parts of a plant, unlike the mineral and chemical elements of a mountain, are *members*: when a change occurs in one, the others are not only thereby affected but affected in such a way as to provoke a *coordinated* response.

Developing the contrast between machines and organisms further, Driesch argues that whereas a phonograph "receives vibrations of the air and gives off vibrations of the air" and so "previous stimulus and later reaction are of the *same* nature," in an organism the "impressions on its sensory organs" (for example, sounds) can issue in something (for example, conversations) that belongs to an "absolutely *different* class of phenomena" (vol. 2, 61, my emphasis). Neither can inorganic systems (as mere matter) *learn* from their experiences, says Driesch, for that entails not only "the mere recollection of what has happened, but . . . also the ability to use *freely* in another field of occurring the elements of former happening for newly combined *individualised* specificities of the future which are *wholes*" (vol. 2, 79). Driesch describes the productivity of organisms as following "a curious principle, which may be called . . . *individual correspondence*. That is to say: any real action is an *individual* 'answer' to an individual stimulus."¹⁶ Such individualized action tailored specifically to the situation at hand constitutes the "directing" action of entelechy.

Elsewhere, Driesch describes this "directing" power as the power to allow one of the many formative possibilities inside the emergent organism to become actual. There are always more potential shapes and lines of development for a cell, organ, or an organism than become actual. In (what we would call) the stem cells of the sea urchin, for example, there is "an enormous number of possibilities of happening in the form of difference of 'potential' in each cell."¹⁷ But if "something else *can* be formed than actually is formed, why then does there happen in each case just what happens and nothing else?" Again Driesch reasons that there *must* be some agent responsible for the singular specificity of the outcome, some decisive agent guarding the entrance to actuality:

According to our hypothesis, . . . in each of the *n* cells the *same* great number of possibilities of becoming is physico-chemically prepared, but checked, so to say, by entelechy. Development of the system now depends, according to our assumption, upon the fact that entelechy *relaxes its suspensory power* and thus . . . in cell *a* one thing is allowed to

occur, in cell *b* another, and in cell *c* something else; but what now actually occurs in *a* might also have occurred in *b* or *c*; for *each one* out of an enormous number of possibilities *may* occur in each cell. Thus, by the regulatory *relaxing* action of entelechy in a system in which an enormous variety of possible events had been suspended by it, it may happen that an *equal distribution of possibilities* is transformed into an *unequal distribution of actual effects*.¹⁸

Note that, once again, Driesch describes the power of entelechy to determine the trajectory of organic growth in negative terms: it acts by selectively "relaxing" its "suspensory power." This capacity for (negative) choice operates in a context of multiple possibilities, and so the actual path of organic growth is not determined in a rigid, mechanical way. Likewise, neither are the individual movements of an adult organism fully determined or mechanically caused by the stimuli of the individual's environment: outside events do affect the individual, but they create only "a *general stock of possibilities* for further acting and have *not* determined all further reactions quite in detail."¹⁹ There is thus an "*indefiniteness* of correspondence between specific cause and specific effect."²⁰ It is in this indefiniteness that "freedom" exists.

In the Gifford lectures, Driesch affirms a qualitative difference between life and matter. Entelechy, that *self-directing activeness* apparent in some bodies, is what distinguishes a crystal from an embryo, a parking lot from a lawn, me from my corpse. But does Driesch also affirm a qualitative difference between human and other forms of life? The question is an important one, I think, because it seems that much of the appeal of vitalism resides in the desire to view man as the apex of worldly existence.²¹ Driesch's response is ambivalent. On the one hand, the "directing" power of entelechy (unlike its "formative" power which is distributed equally across all organisms) operates inside man with special intensity. This is evidenced in his greater capacity for "knowing" and "willing." But, on the other hand, Driesch also believes that some analogue of knowing and willing exists in *all* organic processes: "Indeed, as far as morphogenesis and physiological adaptation and instinctive reactions are concerned, there *must* be a something comparable metaphorically with specified knowing and willing."²²

Close attention to morphogenesis reveals to Driesch a modality of

change distinctive to "life": this change is *organizing, complexifying, holistic, and autonomic* (nondeterministic). But why not model the living systems that entail this type of change as highly complex and dynamic *machines*? If so, then there would be no need to invoke a special vital principle like entelechy to explain morphogenesis. Driesch takes up the question explicitly and finds all mechanistic accounts of morphogenesis inadequate. Here is why: an organism is a working whole capable of innovative action—it repairs injured parts, recreates severed ones, and adapts old parts to perform new roles—all in order to maintain the normal functioning of the whole and to preserve its identity. In contrast, a machine (as a mere aggregation of physico-chemical elements) "*does not remain itself, if you take from it whatever you please.*"²³ Because machines cannot self-repair, one must again conclude that there must be at work in the organism some nonmaterial agent that provides "the specific and real stimulus which calls forth the restoring processes."²⁴

Neither does the machine analogy hold, says Driesch, for individual organs of an organism. An ovary, for example, emerges from a single, totipotent cell ("*Anlage*"²⁵) that "has been divided and re-divided innumerable times," but "*how could a machine . . . be divided innumerable times and yet remain what it was?*"²⁶ Driesch's experimental evidence for this involves the hydroid-polyp Tubularia, whose cut segments, however small, will regenerate the whole organism. According to the "mechanistic" view of the time, each segment would have to contain a machine, each of which, when cut in two, could still function as a half-size but complete machine. Mikhail Bakhtin, an early critic of Driesch's work, aptly describes the conclusions Driesch draws from his experiments on Tubularia:

What kind of machine is this which we can divide to our heart's content and which always preserves its normal functions? A number of highly complex, large and small machines with the same function must be contained within our two cm segment. . . . Moreover, these machines overlap one another: parts of one correspond to completely different parts of another. Such a mechanism contradicts the very concept of a mechanism. Thus, the machine theory (in Driesch's opinion) leads to the absurd.²⁷

In describing entelechy as the invisible but "real stimulus" for the movement of morphing, Driesch also considers the question of whether

entelechy might be conceived as "energy," and thus as a special kind of physico-chemical entity. Again he answers no, rejecting the idea of "vital energy" as oxymoronic, for life is *unquantifiable* and all energies remain for him quantities: "In asserting . . . phenomena to be of the energetical order, we state that there can be a *more or less* of them. . . . *But entelechy lacks all the characteristics of quantity: entelechy is order of relation and absolutely nothing else.*"²⁸

As I have already noted, Driesch's "*critical vitalism*" emphasizes the necessarily intimate relationship between *entelechy and the regular, observable operations of matter*. Entelechy can make use only of "the possibilities of becoming" that are "physico-chemically prepared," for "life is unknown to us except in association with bodies";²⁹ entelechy always "uses material means in each individual morphogenesis" (vol. 2, 295); entelechy cannot make sulphuric acid if no hydrogen is present, but it can "*suspend* for as long a period as it wants any one of all the reactions which are *possible* with such compounds as are present, and which would happen without *entelechy*" (vol. 2, 180). These formulations display Driesch's struggle to make the life-matter relationship as close as it can possibly be without going all the way over to a (mechanistic) materialism and without implying a metaphysics of "soul."

What intrigues me perhaps the most about entelechy is the way it is a figure of an *impersonal kind of agency*. Like Machiavelli's *fortuna* or the Homeric Greek notion of *psuche*,³⁰ *entelechy* is not the unique possession of each individual but rather *a vitality flowing across all living bodies*. Entelechy coordinates parts on behalf of a whole without following a rigid plan; it answers events innovatively and perspicuously, deciding on the spot and in real time which of the many possible courses of development will in fact happen. Neither is the agentic capacity of entelechy a disembodied soul, for it is constrained by the materiality that it must inhabit and by the preformed possibilities contained therein. But despite this heteronomy, entelechy has real efficacy: it animates, arranges, and directs the bodies of the living, even under changing conditions. It is "*an effective extra-spatial intensively manifold constituent of nature.*"³¹

Driesch's invention of entelechy as a creative causality was initially propelled by his assumption that materiality was matter, that is, stuff so passive and dull that it could not possibly have done the tricky work of organizing and maintaining morphing wholes. Sometimes this mat-

ter is infused with entelechy and becomes "life," and sometimes it isn't and coagulates into inorganic "machines." Driesch thought he had to figure entelechy as nonmaterial because his notion of materiality was yoked to the notion of a mechanistic, deterministic machine. In 1926, Mikhail Bakhtin rebutted Driesch on this point, arguing that Driesch failed to imagine the possibility of "a relentlessly self-constructing, developing machine [which] . . . builds itself not from pre-prepared parts, but from self-constructing ones." Such a machine, were it to be damaged, would indeed be capable of a self-repair, a restitution prompted and guided by subtle and interactive physico-chemical signals, and thus would have no need for entelechy.³²

Bakhtin pointed out that Driesch's vitalism depended upon his critique of materialism and that critique depended upon equating materiality with mechanical causality, with an image of machine as a "totally prefabricated" and "fixed and immovable" assemblage.³³ Bakhtin recommended that Driesch rethink what a "machine" can be rather than reject physico-materialist explanation per se.³⁴ I agree.

But I applaud the way Driesch yokes his vital principle to experiential activities in the lab. This helps him to ward off the temptation within vitalism to *spiritualize* the vital agent. As an example of a vitalism that surrenders to this temptation, I turn now to another figure of vital force, the "soul" inside human embryos produced as a result of fertility technologies.

The "Culture of Life"

At the start of the twentieth century, Driesch was engaged in a public debate that was simultaneously moral and scientific: the vitalist-mechanist controversy combined discourses of freedom and vitality with studies of morphology and matter. At the start of the twenty-first century, many Americans were again participating in a similarly hybrid discourse, as can be seen in debates about **abortion, artificial life support, and embryonic stem cell research**. One position in these debates might be described as a latter-day vitalism: it is the "culture of life" position advocated by evangelical and Catholic Christians, including then-president George W. Bush. Like Driesch, defenders of the "culture of life" believe there to be something profoundly inadequate about a materialist metaphysic.

But not all vitalisms are alike, and it seems that the "culture of life" is a

return to what Driesch rejected as a naive vitalism of soul. Driesch took special pains to distinguish his vital principle from the idea of a disembodied spirit, he explicitly eschewed religious dogmatism in favor of laboratory experiments with sea urchins, and he refused political attempts to link the idea of a vital principle to the idea that some forms of life were more vital than others. The vitalism of the culture of life does none of these things.

In May of 2005, President Bush "appeared at the White House with babies and toddlers born of test-tube embryos" in order to dramatize his opposition to embryonic stem cell research. "The White House event, on what conservative Christians and the president call an important 'culture of life' issue, demonstrated just how far Mr. Bush is willing to assert himself on policy that goes to what he considers the moral heart of his presidency. . . . Tom DeLay of Texas managed the opposition to the bill, also casting it in stark moral terms. 'An embryo is a person, a distinct, internally directed, self-integrating human organism.'" ³⁵ At a National Catholic Prayer Breakfast in April 2007, Bush reiterated his commitment to the life of human embryos: "We must continue to work for a culture of life where the strong protect the weak, and where we recognize in every human life the image of our Creator."³⁶ Three days later and four years into a preemptive war estimated to have killed between tens of thousands and hundreds of thousands of Iraqis,³⁷ Bush rejected Senate and House Democrats' attempt to tie \$100 billion in additional funding for the war to a timetable for withdrawal of U.S. troops. Said Bush: "We should not legislate defeat in this vital war."³⁸ Both human embryos and preemptive violence are "vital."

A stem cell is a neologism for a cell believed to be pluripotent, that is, able to become any of the various kinds of cells or tissues of the mature, differentiated organism. The hope is that better understanding of pluripotency will enable scientists to, among other things, induce the production of new nerve cells in damaged spinal cords or new brain tissue in people with Alzheimer's disease.³⁹ The contested procedure consisted in extracting cells from the "blastula" stage of the fertilized egg, when the egg is changing from a solid mass of cells into a hollow ball of cells around a fluid-filled cavity. The blastocyst may then continue on to the "gastrula" stage, where it differentiates into three germ-layers, whose cells, "channeled into their respective fate paths," are no longer pluripotent.⁴⁰ Bush

opposes embryonic stem cell research because the extraction halts the morphological process at the gastrula stage. Former House Republican leader DeLay describes this as “the dismemberment of living, distinct human beings for the purposes of medical experimentation.”⁴¹ Many Americans agreed with him. Stem cells can also be taken from umbilical cord blood, adult human bone marrow, and fertilized embryos too old to be capable of developing further. The Bush administration does not object to these sources of stem cells, perhaps because blood, marrow, and decayed embryos are conceived as dead matter rather than life and thus pose no threat to the “culture of life.”

But what is the “culture of life”? The phrase was the central theme of Pope John Paul II’s 1995 “*Evangelium Vitae*” before it was adopted by non-Catholic evangelicals in the United States to refer to a cluster of theological beliefs linked to a set of public policies.⁴² The policies are easy to name: the culture of life, defined in contrast to “the [secular] culture of death,” has been invoked to support legislation to keep a feeding tube inserted into a woman whose brain function had ceased, to restrict access by minors to abortion and to outlaw certain surgical techniques of abortion, as well as to oppose federal funding for embryonic stem cell research. The *theological or cosmological beliefs within the culture of life* are less clearly articulated, but the following four claims seem central:

- 1 *Life is radically different from matter.* Life is organized, active, self-propelled, and, in diverse registers of the term, “free.” *Matter is intrinsically passive and predetermined in its operation.* Life may be embodied, and when it is, it operates alongside physico-chemical entities and processes. But life is irreducible to the sum of those entities and processes. Life is detachable from embodiment.
- 2 *Human life is radically different from all other life.* The life of human bodies is not only qualitatively different from matter but also from every other life-form. Like other animals, humans are endowed with a life-force, but unlike all others, this force is “a unique life-principle or soul.”⁴³ “If society loses the sense of the essential distinction of human life from animal life and material things, whether in theory or in the practice of attempting to clone a human embryo, it has lost its stature as a human society. It has lost the compass of humanness and is, instead, laying the foundation for the replacement of a hu-

man living with biological chaos.”⁴⁴ The ensouled human organism is a quantum leap above other organisms.

- 3 *Human uniqueness expresses a divine intention.* Human exceptionalism is not a contingent event, an accident of evolution, or a function of the distinctive material composition of the human body. Rather, an omnipotent being (“the Almighty”) implants a divine spark or soul into the human individual.
- 4 *The world is a divinely created order and that order has the shape of a fixed hierarchy.* Humans are not only organic, unique, and ensouled, but ranked at the very top of the hierarchy, in a position *superior* to inorganic matter, to nonhuman organisms, and to the Earth as a whole.

In subscribing to the first point, the belief that life is irreducible to matter, the culture of life qualifies as a kind of vitalism, for it affirms what Driesch said is the central claim of vitalism, that is, that the developmental processes of the organism are *not* “the result of a special *constellation of factors known already* to the sciences of the inorganic,” but are rather “the result of an *autonomy peculiar*” to life.⁴⁵ Insofar as it affirms a soul whose existence is not tied to its relationship to matter, it qualifies as what Driesch called naive vitalism. This “old vitalism” fails to avail itself of the benefit of scientific insight into nature. For Driesch the lab and the reasoning scientist remained the privileged point of access to the life principle, and he insists that it is always “essential to reflect once more with an open mind on the actual biological data.”⁴⁶ The new vitalism was a falsifiable hypothesis and not a dogma that only immoralists dare contest.

Advocates of the culture of life often do affirm science, in particular weapons technology if it advances the project of American mastery. But science can never contravene the theological verities of ensoulment, human exceptionalism, and the qualitative hierarchy of Creation. To DeLay, for example, no revelation from molecular chemistry or complexity theory about the self-organizing capacity of *inorganic* systems could disprove his conviction that matter is inert and only life is free and open-ended. And no data concerning the differential plasticity of cells at the blastula and gastrula stages could possibly alter the conclusion that the fertilized egg is a person ensouled by the Almighty.⁴⁷ What seems to be operative here is a kind of species-narcissism: “life” must remain special—that is, radically

other to matter — if we humans are to be able to think of ourselves as the most special of its expressions.

The culture of life is also more anthropocentric and hierarchical than the vitalism of Driesch. It posits the cosmos as a rank-ordered creation, at the top of which the Designer has placed his most vital creature, man. Man was given dominion over other earthly creatures because he is the most vital of them, in three conjoined senses of the term: he is the most animate or mobile, the most free or capable of action irreducible to the demands of the body and other material conditions, and the most important to the order because he is the image of God. The allied idea that there exist two ontologically distinct substances (brute matter and spirited life), in conjunction with the idea that man has the most life, helps to render practices of hyperconsumption and exploitation of nature laudable acts of human enterprise and productivity. The idea that the world was originally designed as a hierarchy also legitimates a hierarchically structured social order, and it justifies public policies that, because they intensify human inequalities, would otherwise appear unfair or unjust: policies that cut taxes of the wealthy, defend unprecedented levels of corporate executive compensation, and oppose universal health care. The presumption that the principle governing the divine hierarchy is rule by the most free species legitimizes a series of civilizational acts of violence committed in the name of allowing “freedom” to flourish among more and more peoples. Here, the violence of preemptive war, state-sponsored torture, and the militarization of outer space⁴⁸ become generous acts in accord with a culture of life where, in Bush’s words, “the strong protect the weak, and where we recognize in every human life the image of our Creator.” When lodged inside such a divine hierarchy, the culture of and for “life” becomes the righteous domination of the earth by God’s most free and vital creatures, that is, Americans. Or, as the post-9/11 bumper sticker announced in the grammar of a command: “God Bless America.”

I don’t think, however, that there is something intrinsic to vitalism, to the idea of the “autonomy of life,” that ties it to militarism, political inequality, insistently wasteful consumption, or civilizational imperialism. Driesch, for example, explicitly dissociated his vitalistic holism from a steep moral hierarchy and the desire for mastery, whether expressed as the view that humans should rule supreme over nonhumans or the view that one group of people has a natural right to dispose of the others. At the end

of *The History and Theory of Vitalism*, Driesch goes so far as to reject his own image of nature as divided into dead matter and organic life. He there concludes that everything, whether “inorganic” or “organic,” must be entelechial, life-ly, or vitalistic: “*nature is a something in evolution*. All natural becoming is like *one great embryology*.” Driesch thus ends his defense of vitalism by “destroying” “the [very] difference between ‘mechanism’ and ‘Vitalism,’ . . . which we have established so carefully.”⁴⁹

And when the Nazis took up his theory of organic wholes directed by a vital principle in support of their claim that the German nation had to fulfill its vital destiny and wage its vital wars,⁵⁰ Driesch objected vehemently. “Entelechy recognized no state boundaries and . . . therefore the only biological ‘whole’ to which one could rightfully belong was ‘humanity.’ He opposed rising militarism in equally biological language, declaring that the militaristic actions of nature against nation needed to be recognized for what it was: ‘*the most terrible of all sins*’ against the vitalistic principles of life, holistic cooperation and higher development.”⁵¹

As I see it, the important political question that “culture of life” vitalism raises is not “Is the embryo matter or life?” but “How can the figure of life join forces with a celebration of (righteous) violence?” I have tried to illuminate an inner link between, on the one hand, Bush’s repeated invocations of life, freedom, and care for the weak, and, on the other hand, his policies of torture, economic inequality, and preemptive violence. The charge of hypocrisy does not quite get at what is at work here. Rather, it seems that faith in the idea of a divinely created *hierarchy* — of the righteous domination of some parts over others — flows into faith in the otherwise inexplicable ideas that the rich deserve to get richer, that war is prolife, and that force can set us free.

Whereas Drieschean and Bushean vitalisms diverge on the question of hierarchy, they share a valorization of freedom or the element of unpredictability and indeterminacy in action. For both, the world contains persistent moments of freedom, despite the comforting regularity provided by natural or divine law. To believe in entelechy is to affirm the freedom of a certain “*indefiniteness* of correspondence between specific cause and specific effect,”⁵² a capacity for the aleatory that Driesch extended to the universe as a whole. To believe in the soul is also to affirm a kind of freedom, though one restricted to the “life” embodied in humans: this is the freedom for the sake of which America invades the territories of those

humans who “hate freedom” because “they love terror,”⁵³ but also the free will of a humanity capable of acts worthy of moral credit or blame.

Bakhtin was critical of the way Driesch’s ostensibly scientific descriptions insinuated the metaphysical assumption of freedom. Driesch claimed that the blastomere contained multiple intensities, only one of which will be chosen by *entelechy*, but because at any given time and place there is in fact only *one* possible outcome of morphogenesis, Driesch’s “talk of several potentials and possibilities serves only one purpose: it allows for the presupposition that they are all equally possible . . . and that therefore it is possible to *choose* one of them freely. Freedom of choice . . . is the ground of all of Driesch’s constructions.”⁵⁴ Bakhtin, I think, correctly identifies what is at stake in the vitalism of Driesch, and, albeit in a different one of its registers, also at stake in the vitalism of Bush. It is freedom, or faith in the existence of an undetermined world.

This resilient faith may help to explain vitalism’s ability to repeatedly rise from the dead, to recur in history despite serial attempts to debunk and dispel it. Vitalism may also draw some of its enduring, or at least periodic, vitality from the fact that there seems to be something inside the practice of experimental science—its pragmatic quest for useful results, perhaps?—that leads it to *understate* or downplay the freedom, the energetic fluidity or surprising creativity of the natural world. This seems to be the case long after mechanistic models of nature have morphed into systems theory and complexity theory, and long after the figure of inert matter has been challenged by fluid dynamics and chaos theory, as well as by the many earlier biophilosophies of flow that Michel Serres chronicles in *The Birth of Physics*. But if there is something internal to scientific thinking that is uneasy about highlighting the idea of an element of indetermination intrinsic to nature, perhaps this is also because, in the West, to admit to indetermination is always to invite its colonization by dogmatic forms of Christian theology. Hence, Bush and the politics of the culture of life.

Vital Materiality

The National Institutes of Health 2001 Report on Stem Cells made two claims that surprised me, a surprise that revealed the extent to which I too had absorbed a machine model of nature. The first claim was that no one

yet knows whether “embryonic stem cells” exist as such in human embryos in the womb, that is, whether they have a presence *before* they are extracted from blastocysts and placed in a new, laboratory-generated milieu. Though “most scientists now agree that *adult* stem cells exist in many tissues of the human body (*in vivo*), . . . it is less certain that embryonic stem cells exist as such in the embryo. Instead, embryonic stem cells . . . *develop in tissue culture* after they are *derived* from the inner cell mass of the early embryo.”⁵⁵ The second unexpected claim was that it is also uncertain whether even the stem cells produced in the lab are in fact “homogeneous and undifferentiated,” even though they appear to be and their promise of pluripotency is premised upon that state of pure, quivering indeterminacy. What?! “Embryonic stem cells” might not even *exist* in the body and their laboratory avatars might not even *be* an exemplar of undifferentiated pluripotency?

I would not have been so surprised by this evidence of indeterminacy unless I had been thinking of my body as a physiological mechanism with fixed and determinate parts, including stem cells. In contrast, the NIH researchers seem to be encountering materiality as a continuum of becomings, of extensive and intensive forms in various states of congealment and dissolution. If no “embryonic stem cells” turn out to exist *in vivo*, it may be because an embryo is *not* a collection of discrete parts, perhaps not even of protoparts or preformed possibilities, and that it is only in the closed system *of the lab* that *a vital materiality* allows itself to be sliced and diced into “embryonic stem cells.”

If we think of the term *entelechy* as an attempt to name a force or an agency that is naturalistic but never fully spatialized, actualized, or calculable, as akin to what Georges Canguilhem described as “des enclaves d’indetermination, des zones de dissidence, des foyers d’heresie,”⁵⁶ then this vitalist gesture is not inimical to the materialism I seek. This materialism, which eschews the life-matter binary and does not believe in God or spiritual forces, nevertheless also acknowledges the presence of an indeterminate vitality—albeit one that *resists* confinement to a stable hierarchy—in the world. It affirms a cosmos of a lively materiality that *is* my body and which also operates outside it to sometimes join forces with it and sometimes to vie against it. Despite his great admiration for the wondrous complexity of nature, Driesch could not quite imagine a “material-

ism" adequate to it. Nevertheless, I now locate my "vital materialism" in Driesch's wake. Emerson wrote in his journal: "I have no longer any taste for these refinements you call life, but shall dive again into brute matter." I too go diving there, and find matter not so brute at all.

Notes

- 1 I develop the idea of "thing-power" in "The Force of Things."
- 2 The "critical vitalism" of Henri Bergson and Hans Driesch, which contrasted itself to a "naïve" vitalism that "allowed for spiritual animation amidst the workings of physical law," emerged "in the nineteenth century transition from a matter-based physics to an energy-based physics." Burwick and Douglass, "Introduction" to *The Crisis in Modernism*, 1. Driesch describes his vitalism as "modern" or "new" in *The History and Theory of Vitalism*.
- 3 Quirk, *Bergson and American Culture*, 1–2. Quirk also places the works of Willa Cather and Wallace Stevens in this context: "Both Cather and Stevens believed in the 'creative power,' and both . . . linked this power to a vital force, biological in nature and primordial in origin" (8). See also the debates between Arthur O. Lovejoy and H. S. Jennings about vitalism during the period 1911–15: Lovejoy, "The Meaning of Vitalism"; Lovejoy, "The Import of Vitalism"; Jennings, "Driesch's Vitalism and Experimental Indeterminism"; Lovejoy, "The Meaning of Driesch and the Meaning of Vitalism"; Jennings, "Doctrines Held as Vitalism."
- 4 A 1916 review of Driesch's *The History and Theory of Vitalism* notes that vitalism "will not go down. A consideration of recent literature drives us to this conclusion. One of the most widely read philosophical works of the past few decades (Bergson's *Creative Evolution*) is primarily a defense of this doctrine. The writings of Driesch, both in German and in English, have followed one another with marvelous rapidity and forced themselves upon the attention of even the most unswerving mechanist." Sumner, "Review."
- 5 Driesch, *The Science and Philosophy of the Organism*, vol. 2, 321.
- 6 Kant, *Critique of Judgment*, sec. 78, #411.
- 7 Ibid., sec. 73, #394.
- 8 Ibid., sec. 65, #374.
- 9 Driesch rejects a Spinozist theory of "psycho-physical parallelism" precisely because Spinozism, as Driesch understands it, holds "that the physical side of [the] . . . duality forms a continuous chain of strictly physico-chemical or mechanical events without any gap in it." Driesch, *The Science and Philosophy of the Organism*, vol. 2, 115. It is very important to Driesch that his own "proof" of vitalism be understood to be a negative one: "All proofs of vitalism i.e. all reasonings by which it is shown that not even the machine-theory covers the field of biological phenomena, can only be indirect proofs: they can only make it clear that mechanical or singular causality is not sufficient for an explanation of what happens." Driesch, *The History and Theory of Vitalism*, 208.
- 10 Driesch, *The Science and Philosophy of the Organism*, vol. 2, 144.
- 11 In Nature conceived scientifically — as here-now-such, there is "no room for 'psychical' entities at all." Driesch, *The Problem of Individuality*, 33. Driesch makes the same point in *The Science and Philosophy of the Organism*, where he says that "there 'are' no souls . . . in the phenomenon called nature in space" (vol. 2, 82).
- 12 Driesch, *The Science and Philosophy of the Organism*, vol. 1, 50, my emphasis. On this point Driesch echoes Kant's claim that in judging *organized* beings, "we must always presuppose some original organization that itself *uses* mechanism." Kant, *Critique of Judgment*, sec. 80, #418, my emphasis.
- 13 Driesch, *The Problem of Individuality*, 34.
- 14 Driesch does not elaborate on his differences with Aristotle and says only that he will retain Aristotle's idea that "there is at work a something in life phenomena 'which bears the end in itself.'" Driesch, *The Science and Philosophy of the Organism*, vol. 1, 144.
- 15 A blastocyst is the name for the developmental stage of a fertilized egg when it has changed from a solid mass of cells into a hollow ball of cells around a fluid-filled cavity.
- 16 Driesch, *The History and Theory of Vitalism*, 213. Or, as he puts the point in *The Science and Philosophy of the Organism*, vol. 1, 67: there is an "'individuality of correspondence' between stimulus and effect."
- 17 Driesch, *The Problem of Individuality*, 38. In the vocabulary of today, it might be said that the stem cells have not yet been channeled into their respective "fate paths."
- 18 Ibid., 39.
- 19 Driesch, *The History and Theory of Vitalism*, 213.
- 20 Driesch, *The Science and Philosophy of the Organism*, vol. 2, 72, my emphasis. The organism's ability to respond perspicuously and inventively to an event (its capacity for "individual correspondence") is not *radically* free: entelechy is incapable of producing that which is *utterly* new, for its intelligent responsiveness remains under the guidance of compacted intensities, which Driesch describes as "a general stock of possibilities."
- 21 This desire is quite overt in Joseph Chiari's defense of Bergson and Driesch: "Darwin thought that changes and mutations were due to chance; Lamarck ascribed them to the pressure of the environment and to functionalism; Bergson ascribes them to the natural resistance that matter offers to the informing spirit which, through man, evolves into consciousness and therefore gives man his favored position as the goal and the apex of creation." Chiari, "Vitalism and Contemporary Thought," 254.

- 22 Driesch says he doesn't know just what this "something" is, but though it "may seem very strange" that the most perspicuous "'means' toward [the] ... end [of maintaining the organic whole] are known and found" by every organism, "it is a fact." *The Science and Philosophy of the Organism*, vol. 2, 143.
- 23 Driesch, *The History and Theory of Vitalism*, 210.
- 24 *The Science and Philosophy of the Organism*, vol. 1, 110.
- 25 Driesch distinguishes, in his empirical proofs for vitalism (which are better described as disproofs of the sufficiency of a mechanistic account of morphogenesis) between the process of "the differentiation of the harmonious systems" and the development of the original cell within which differentiation will occur. The latter is "not what comes out of the complex systems, but what they themselves come from. And we shall take the ovary as one instance standing for them all. The ovary develops from one special single cell which is its *Anlage*, to use a German word not easy to translate." Driesch, *The Problem of Individuality*, 21–22.
- 26 Driesch, *The History and Theory of Vitalism*, 212.
- 27 Bakhtin, "Contemporary Vitalism," 89.
- 28 Driesch, *The Science and Philosophy of the Organism*, vol. 2, 169. What could it mean to be exclusively an "order of relation"? Driesch sheds some light on this notion by describing entelechy as an "agent that arranges" elements into a harmonious whole. Driesch sees evidence of this arranging power in instinctive movements: although "physiological factors" play a role in instincts, "there would be something else also at work, a 'something' that may be said to make use of the factors" (vol. 2, 51). This "new and autonomic natural factor ... unknown to the inorganic world" (vol. 2, 114) is also "at the root of the transformism of the species" (vol. 1, 287). In addition, such an arrangement must have been operative in the process of inheritance. A mechanical explanation would speak only of the transfer of material units "localized in the nucleus," but, again, these material conditions cannot be "*the main thing*. Some agent that *arranges* is required, and this arranging agent of inheritance cannot be of a machine-like, physico-chemical character." Driesch, *The Problem of Individuality*, 23. Why not? Because, the physicochemical is by definition incapable of the "arranging" agency required. Arranging agency requires both precision and flexibility, an ad hoc judging exquisitely attuned to the singularity of the parts it is to arrange and the singularity of the context in which the organism swims. Physicochemical elements, qua inert matter, are too obedient to generic laws to perform the required juggling, too routinized to arrange artfully.
- 29 Driesch, *The Science and Philosophy of the Organism*, vol. 1, 16.
- 30 Psuche marks the difference between a living human and an inactive corpse. It is "composed of a very tenuous stuff, which resides in the body while the individual is alive, flies away through some orifice at death and goes down to

- Hades"; it is "simply that whose presence ensures that the individual is alive." Adkins, *From the Many to the One*, 15.
- 31 Driesch, *The Science and Philosophy of the Organism*, vol. 2, 326, my emphasis.
- 32 Bakhtin, "Contemporary Vitalism," 95–96. Bakhtin names this alternative machine-image "modern dialectical materialism" in contrast to Driesch's "naïve-mechanist point of view with its fixed and immovable machines" (96). K. S. Lashley makes a similar point in 1923: "The vitalist cites particular phenomena—morphogenesis, regeneration, habit-formation, complexities of speech, and the like—and denies the possibility of a mechanistic account of them. But he thereby commits what we might term the egoistic fallacy. On analysis his argument reduces every time to the form, 'I am not able to devise a machine which will do these things; therefore no one will ever conceive of such a machine.' This is the argument from inconceivability of Driesch and McDougall, put badly. To it we may answer, 'You overvalue your own ingenuity.'" Lashley, "The Behavioristic Interpretation of Consciousness," Part 1, 269.
- 33 Bakhtin, "Contemporary Vitalism," 95–96.
- 34 So do Deleuze and Guattari. In *A Thousand Plateaus* they describe Nature as a plane of morphogenesis, which they call a "war-machine." Paul Patton suggests that a better term would have been "metamorphosis machine": "the 'war-machine' ... is a concept which is betrayed by its name since it has little to do with actual war and only a paradoxical and indirect relation to armed conflict. [Its] ... real object ... is not war but the condition of creative mutation and change." Patton, *Deleuze and the Political*, 110.
- 35 Stolberg, "House Approves a Stem Cell Bill Opposed by Bush," 1.
- 36 Cole, "Bush Stands against 'Temptation to Manipulate Life:'"
- 37 The lower estimate is from iraqbodycount.org, the larger one from Les Roberts and Gilbert M. Burnham of the Center for International Emergency, Disaster, and Refugee Studies at the Johns Hopkins Bloomberg School of Public Health in Baltimore; Richard Garfield of Columbia University in New York; and Riyadh Lafta and Jamal Kudhairi of Baghdad's Al-Mustansiriya University College of Medicine.
- 38 White House, "President Bush Discusses Iraq War Supplemental."
- 39 A stem cell, while pluripotent, is not "totipotent" or, as Driesch described it before the concept of stem cell was invented, is not a "potency" able to "play every single part in the totality of what will occur in the whole system." Driesch, *The Science and Philosophy of the Organism*, vol. 1, 120–21. See also National Institutes of Health, *Stem Cells*, ES-2.
- 40 Maienschein, "What's in a Name," 12.
- 41 Tom DeLay, quoted in Baer, "In Vitro Fertilization, Stem Cell Research Share Moral Issues." There is some dispute over whether a pregastrulated mass is an "embryo." If an embryo is defined as a fertilized egg, then the

answer is yes. But others define an embryo as a dividing egg that has passed *through* gastrulation: "many biologists . . . don't call these early stages of development an embryo, but a preimplantation embryo or pre-embryo. The preimplantation embryo passes through three stages during its week of development: a zygote (one cell), morula (multiple cells in a cluster, all the same), and blastocyst [blastula] (when it develops sections, including a yolk sac, and has an inside and outside but still none of the defined structures of an embryo)." Spike, "Open Commentary," 45.

42 "Evangelium Vitae."

43 Best, "Testimony of Robert A. Best, President, the Culture of Life Foundation."

44 Ibid.

45 Driesch, *The History and Theory of Vitalism*, 1. Driesch defines vitalism as "the doctrine of the *autonomy of life*. . . . I know very well that . . . 'autonomy' usually means the faculty of *giving* laws to oneself, and . . . is applied with regard to a community of men; but in our phrase autonomy is to signify the *being subjected* to laws peculiar to the phenomena in question." *The Science and Philosophy of the Organism*, vol. 1, 143. Although, in the main, by the "autonomy" of life, Driesch is referring to the ability of organisms to self-arrange and self-restore, his use of the term also retains something of the Kantian sense of freedom, freedom from determinism. Henri Bergson affirms something close to Driesch's view; for Bergson, while "analysis will undoubtedly resolve the process of organic creation into an ever-growing number of physico-chemical phenomena, . . . it does not follow that chemistry and physics will ever give us the key to life." Bergson, *Creative Evolution*, 31.

46 *The History and Theory of Vitalism*, 57–58.

47 It is worth noting here that one need not be an atheist to reject the particular constellation of ideas inside the "culture of life": pantheisms of various sorts discern divinity in *all* things, human and nonhuman, organic and inorganic; many "Jewish and Muslim scholars . . . regard life as starting . . . 40 days" after fertilization; some believers affirm that God would approve of embryonic stem cell research as a fuller realization of the potential within the process of morphogenesis. See Maienschien, "What's in a Name," 14.

48 In 2001, Donald Rumsfeld "recommended that the military 'ensure that the president will have the option to deploy weapons in space'"; in 2002 Bush "withdrew from the 30-year-old Anti-Ballistic Missile Treaty, which banned space-based weapons"; and in 2005 General Lance Lord of the Air Force Space Command "told Congress [that] . . . 'we must establish and maintain space superiority.'" New York Times News Service, "U.S. Policy Directive Might Open Door to Space Weapons."

49 Driesch, *The History and Theory of Vitalism*, 223–24.

50 "Après 1933, l'entelechie est devenue un *Führer* de l'organisme," Canguilhem, "Aspects du vitalisme," 124.

51 Harrington, *Reenchanted Science*, 190. After Hitler came to power in 1933, "Driesch was one of the first non-Jewish German professors to be forcibly retired" (191).

52 Driesch, *The Science and Philosophy of the Organism*, vol. 2, 72, my emphasis.

53 Terrorists kill because "they hate freedom." White House, "Remarks by President and Mrs. Bush in Interview by Television of Spain." "The more free the Iraqis become, the more electricity is available, the more jobs are available, the more kids that are going to school, the more desperate these killers become, because they can't stand the thought of a free society. They hate freedom. They love terror." White House, "President Bush, Ambassador Bremer Discuss Progress in Iraq."

54 Bakhtin, "Contemporary Vitalism," 92. The fuller quotation reveals Bakhtin's own deterministic materialism: "It obviously goes without saying that at every place and every time, some specific conditions prevail. Therefore it is completely absurd to say [as Driesch does] that any particular possibility of development is really contained in a given blastomere. The potential is contained within it . . . to the same degree that it is part of the complex of its surrounding conditions. What is Driesch doing? He strays from any real conditions, locating abstract blastomere outside of the frames of time and space. . . . Talk of several potentials and possibilities serves only one purpose: it allows for the presupposition that they are all equally possible . . . and that therefore it is possible to choose one of them freely. Freedom of choice, not determinism in organic life, is the ground of all of Driesch's constructions."

55 National Institutes of Health, *Stem Cells*, ES-9, my emphasis.

56 Canguilhem, "Aspects du vitalisme," 121. This is a description evangelical Christians, with their strong sense of an ordered Creation, would most likely reject.